CALIFORNIA STATE DEPARTMENT OF PUBLIC HEALTH
WALTER M. DICKIE, M.D., Director

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Bodily Resistance and Lowered Vitality

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Dr. H. W. Hill of the University of British Columbia, at Vancouver, has been publishing an interesting series of articles on public health in the monthly bulletin of the British Columbia Board of Health.

In a recent issue he discusses "lowered vitality" versus specific resistance. He states that the chief opponents of modern medicine base the principles of their opposition and the alternative practice which they recommend on the doctrine that all disease is due to lowered vitality from faulty diet, exercise, sleep, etc., and that certain foods, certain exercises, etc., keep up resistance against them. When protection against smallpox, diphtheria, typhoid, etc., is advocated by such nonspecific means, and the cure of tuberculosis and of cancer by starvation, the specificity of bodily reactions can not be overemphasized.

"(There are great advantages in wholesome food, proper exercise, etc. and great disadvantages in the converse, but these advantages and disadvantages relate to the systems involved, and not to specific resistances against unrelated assailants. Lack of certain vitamins in the diet may produce the purely nutritional diseases scurvy or beri-beri but never measles or smallpox; nor will any vitamin give specific protection against either of the latter—or any other infection.)

Thus: that the tetanus bacillus (uncontaminated, free of toxin and in spore form) introduced without local damage into normal living tissue is harmless, but introduced into crushed, devitalized, necrotic tissue is effective as a systemic (neural) poison, has been taken as proof of the general idea that a lowering of *local* vitality may aid in producing a general disease.

True enough; but this is a very different thing from a lowered local vitality producing a lowered *specific resistance,* although the two seem to have been often confused by propagandists, both the altruistic and the commercial.

Now the real situation seems to be this—that the local injury permits the tetanus bacillus to grow and to produce toxin, but does not depress the mechanisms of specific resistance at all—rather, the toxin actually *tends to elicit* or to further develop such potentialities as the body may possess for mkaing the needed tetanus antitoxin. Indeed, we know of no substance in the universe that will do so, except the product (tetanus toxin) which the devitalization of the tissues permits to appear.

Again: if the body is already actively immune to tetanus or is promptly made passively immune by injection of ready-prepared tetanus antitoxin, the local injury, its shock, its devitalization, its necrosis, does not depress the active immunity nor interfere with the passive immunity; in either case the patient escapes *tetanus,* whatever other damage his injury may entail.

The evidence available makes it reasonable to designate the tetanus bacillus (like the skin-coccus) as a saprophytic *ectoparasite*—but anaerobic and therefore living in the intestinal contents (both of horses and man) rather than in the dead epithelium of the epidermis. Being unable to flourish in normal *living* tissue, both tetanus bacillus and skincoccus are harmless until they reach into the body at a point where injury (or previous infection) supplies them with dead or dying material—and with anaerobic conditions also, in the case of the tetanus bacillus. Hence arises the tetanus attack following a relatively extensive crushed, devitalized wound, and the stitch abscess following the relatively slight crushing and devitalization of a too-tight stitch. The spectacular symptoms and high fatality of the tetanus attack contrast with the relative innocence of the stitch abscess—but this difference rests on the relative poisonousness of the respective toxic bodies formed rather than on any essential difference in the circumstances of the invasion.

In both instances the "depression of (local) vitality" which permits invasion is nonspecific—for it permits invasion by *any* micro-organism whose biological peculiarities fit the altered conditions (e.g. the "gas bacillus" group, etc.); and in neither instance is any potentiality of the body for *specific* resistance lowered—the invasion actually furnishing the specific toxin by which alone such potentiality may be elicited.

Turning now to the doctrine that lowered *general* vitality acts to lower specific resistance, Pasteur's classic experiment of securing an anthrax attack in normally anthrax-proof fowls by chilling them after inoculation is often quoted—misquoted, apparently—in its favor; as is also the converse experiment, of securing an anthrax attack in normally anthrax-proof reptiles by warming them.

But it appears that fowls and reptiles have *no* specific immunity to anthrax (and therefore of course it can not be *lowered* by any means whatever). It is the *high temperatures* of fowls, and the *low temperatures* of reptiles, that are unfavorable to the growth of anthrax; and in the case of fowls, at least, to streptococci and some other ready invaders of the human. Now in the human, the *normal* temperature is intermediate between that of fowls and that of reptiles. Chilling of the human is therefore unnecessary for invasion by either germ, for the *normal* human temperature suits both—as is true for nearly all, if not all, the ordinary infections of man. Only a very loose reasoning can deduce from the fowl-anthrax experiment that *any* 'lowered general vitality' (not necessarily chilling) encourages *all* infections (not necessarily anthrax) in the *human* (as well as in the fowl).

Is not the reasoning just as loose which would deduce from the reptile-anthrax experiment that *raising* the temperature of the human also depresses 'general vitality' to the point of lowering specific resistance?

It is of course true that many infections in the human show a decided rise of temperature—but this rise *follows,* does not precede, the invasion; and usually does not appear from some hours or days; in typhoid fever for an average of two weeks later. There is evidence that such fever (like the artificial raising of the patient's temperature, now employed therapeutically in syphilis) is really inimical to most pathogens which affect the human—perhaps is rather an effort of the *stimulated* body to produce conditions unfavorable to the germs. If so, is the fever not an evidence of a *raised* rather than of a *lowered* 'vitality'?

One certainty can not look upon malarial fever as 'lowering the vitality' of the patient in any such manner that his *specific* (or any other) resistance to syphilis is lowered also—for malarial fever in some forms is used successfully for getting rid of the syphilis germ in certain obstinate cases.

As a matter of common medical knowledge the syphilis germ, in contrast with tetanus and skin cocci, is (like vaccine virus against smallpox) a very strict parasite and practically is limited to the living human tissue for food and growth. Both syphilis and vaccinia invade and develop in ordinary *normal living* human tissue, requiring no depression of vitality whatever as an adjuvant but only such conditions as will present to them *normal living* tissue; e.g. the removal of the dead epithelium of the skin surface. In this dead epithelium they will not grow; but once admitted by its removal to the underlying *healthy living* tissues, they are fully at home.

The relationships of certain cocci to diabetes, to influenza, to diphtheria, to smallpox and perhaps even to scarlet fever, are still obscure, the streptococci especially presenting species, varieties, strains of a most confusing multiplicity. But whether the explanation of the, at times, terrific activity of some of the cocci as secondary invaders in these diseases be due to the furnishing to them of devitalized tissue (as described for tetanus) or to the furnishing to them of access to living tissue (as described for vaccinia) or to some other factor there is no evidence that any *specific* resistance is lowered by their predecessors or by themselves."

INFECTIOUS DISEASE DEATHS AMONG CHILDREN

A study of mortality among children under 15 years of age in California by five-year periods since 1906 has been completed. Whooping cough is still a major cause of death among infants just as it was 30 years ago. Tuberculosis, all forms, still claims a considerable number of infant lives although the rates have been lowered considerably during recent years. The reduction in diphtheria and typhoid fever mortality among children under 15 years of age is most conspicuous. The most outstanding results have been achieved in reducing the diphtheria rate among children between 5 and 14 years of age.

ANTIPASTO

An outbreak of food poisoning due to imported antipasto occurred during November. This is the second outbreak of food poisoning due to this imported product that has occurred within the last few years. An effort is being made to determine if the infected product has been distributed on a state-wide basis.

COCCIDIOIDAL GRANULOMA

(Continued from last issue)

Comment

Very little is known about the prevention and treatment of coccidioidal granuloma. It is necessary to have an exhaustive and comprehensive study of the forms or types of the causative organism, of immunity and resistance to it in man and animals, of its relationship to tuberculosis, of the distribution of the organism in nature, and finally of the scientific evolution of some form of therapy. Perhaps funds for such a study could be obtained from the national government. It is my understanding that a certain amount of the four billion dollars recently voted by congress is to be used for public health work. Could not this organization unite on the investigation of this one problem of coccidioidal granuloma and make an urgent plea for funds, on the basis of scientific and economic need?

Summary

1. Very little progress has been made in the treatment or prevention of coccidioidal granuloma in the 43 years that have elapsed since the first case was described.
2. Ten per cent of the reported cases of coccidioides are in children 18 years of age or under, mostly foreign-born.
3. Forty per cent of the reported cases have lived in endemic areas for less than one year.
4. Seventy-two per cent of the cases are in foreign-born.
5. Two additional types of coccidioides have been reported from South America.
6. Two cases of coccidioidal granuloma were recently reported from Hawaii.
7. Unsuccessful treatment of coccidioidal granuloma with "Faudin," large doses of antimony and potassium tartrate, "Atabrine," heat therapy and pooled adult serum is reported.
8. A plea is made to attempt to obtain funds from the national government for an exhaustive study of the entire problem of coccidioidal granuloma.

TUBERCULOSIS MORTALITY BY AGE GROUPS

A study of tuberculosis mortality by age groups in California since 1910 has been completed. It is interesting to note that during recent years the reduction in the tuberculosis death rate has been most outstanding in those from 35 to 44 years of age. The highest rate is in individuals who are 65 years of age and over, although the tuberculosis death rate for infants is still very high.

BACTERIOLOGICAL LABORATORY ACTIVE

Following is the diagnostic detail of bacteriological examinations performed in this laboratory during November:

Slides prepared and examined for the diagnosis of diphtheria, tuberculosis, gonorrhoea, malaria, rabies, culture identification	3382
Plate cultures made, examined and selected colonies transplanted during examination for typhoid, paratyphoid, dysentery, food poisoning, plague, unknown determinations, etc.	450
Culture tubes inoculated (fluid and solid media) for testing sugar reactions and other cultural characteristics during the identification of unknown cultures isolated in blood, stool and food examinations and sent in by other laboratories	815
Animal inoculations for virulence tests, Kellogg tests, tuberculosis of kidneys, meningitis, standardizing vaccines, making immune serums, etc.	292
Precipitation tests, principally for syphilis	957
Complement fixation tests, principally for syphilis, but also for identification of cultures and immune serums	3026
Agglutination tests, each one involving the making of eight different serum dilutions, centrifuging and examining; required for Widal tests for typhoid, undulant fever, typhus, tularemia and for identification of cultures, etc.	310
Total of procedures	9232
Number of cases represented	4381

IMPORTED EGGS

Factories, candy shops, macaroni and bakery supply houses are inspected for determining the use of imported Chinese eggs illegally. It was found that an importer has been storing this product in a warehouse where it has been repacked in wooden barrels before delivery to manufacturers. The repacking of this material is prohibited by law and Chinese eggs can not be used without properly declaring the fact.

MORBIDITY

Complete Reports for Following Diseases for Week Ending January 11, 1936

Chickenpox

736 cases: Alameda County 2, Alameda 11, Berkeley 30, Emeryville 5, Oakland 21, Piedmont 2, Contra Costa County 18, Pittsburg 8, Fresno County 15, Fresno 6, Orland 1, Imperial County 1, Kern County 17, Hanford 3, Lassen County 1, Los Angeles County 18, Alhambra 11, Burbank 1, Compton 2, Culver City 2, Glendale 12, Huntington Park 4, Long Beach 3, Los Angeles 53, Monrovia 1, Pasadena 7, Santa Monica 2, South Pasadena 12, Whittier 14, Lynwood 1, South Gate 4, Monterey Park 1, Maywood 1, Madera County 1, Marin County 6, Willits 1, Merced County 16, Merced 9, Monterey County 1, Monterey 1, Pacific Grove 1, Napa County 1, Orange County 18, Orange 10, Santa Ana 20, Placentia 4, Colfax 7, Riverside County 15, Beaumont 5, Riverside 2, Sacramento 49, San Bernardino 5, San Diego County 19, Chula Vista 1, National City 4, San Diego 36, San Francisco

79, San Joaquin County 16, Stockton 16, Tracy 11, San Luis Obispo 3, San Mateo County 1, San Mateo 1, Menlo Park 6, Santa Barbara County 3, Lompoc 1, Santa Barbara 10, Santa Clara County 10, Los Gatos 1, Palo Alto 1, San Jose 19, Willow Glen 1, Santa Cruz 1, Stanislaus County 3, Modesto 1, Tulare County 3, Exeter 1, Tuolumne County 2, Ventura County 9, Yolo County 4, Davis 1, Woodland 9, Marysville 1.

Diphtheria

33 cases: Oakland 2, Fresno County 1, Fresno 3, Imperial County 1, Los Angeles County 1, Los Angeles 7, Pacific Grove 1, Corona 1, Sacramento 5, San Bernardino County 1, San Diego County 1, National City 1, San Diego 1, San Joaquin County 1, San Luis Obispo County 2, San Luis Obispo 1, San Jose 2, Marysville 1.

German Measles

192 cases: Alameda County 8, Berkeley 2, Hayward 1, Oakland 1, Piedmont 1, Calaveras County 2, Contra Costa County 38, Pinole 2, Richmond 6, Fresno County 19, Inyo County 2, Bishop 25, Los Angeles County 2, Long Beach 4, Los Angeles 8, Pasadena 8, South Gate 2, Orange County 5, Anaheim 1, Orange 3, Santa Ana 23, La Habra 1, Laguna Beach 1, Placentia 1, Tustin 8, Riverside 4, Sacramento 1, Chula Vista 1, National City 1, San Diego 2, San Francisco 3, Daly City 1, Menlo Park 1, Palo Alto 1, Red Bluff 1, Ventura County 1, Ventura 1.

Influenza

63 cases: Berkeley 1, Oakland 3, Fresno County 2, Eureka 1, Los Angeles County 3, Glendale 3, Long Beach 10, Los Angeles 24, Pasadena 2, Santa Monica 1, Monterey Park 1, Merced County 2, Napa County 1, Anaheim 1, San Francisco 2, San Joaquin County 1, Siskiyou County 1, Sonora 1, Fillmore 3.

Malaria

5 cases: Westmoreland 1, Placer County 3, California 1.*

Measles

747 cases: Albany 29, Berkeley 23, Oakland 27, Piedmont 2, Butte County 17, Chico 1, Oroville 21, Colusa County 1, Martinez 3, Richmond 1, El Dorado County 1, Fresno County 7, Fresno 19, Kern County 2, Lassen County 1, Los Angeles County 62, Claremont 2, Compton 1, Covina 1, Culver City 1, Hermosa 3, La Verne 1, Long Beach 5, Los Angeles 84, Monrovia 1, Pasadena 5, Pomona 5, Redondo 1, San Gabriel 1, Santa Monica 1, South Pasadena 2, Whittier 2, South Gate 8, Madera County 1, Madera 18, San Rafael 1, Fort Bragg 8, Monterey County 53, Carmel 12, Monterey 3, Pacific Grove 1, Salinas 18, Napa County 3, Napa 1, Orange County 1, Santa Ana 1, Laguna Beach 1, Colfax 2, Riverside County 3, Beaumont 1, Riverside 10, Sacramento 4, San Bernardino County 1, San Bernardino 2, La Mesa 2, National City 2, San Diego 2, San Francisco 77, San Joaquin County 8, San Luis Obispo County 1, San Luis Obispo 2, Burlingame 2, Daly City 1, South San Francisco 2, Santa Barbara County 4, Lompoc 5, Santa Barbara 1, Santa Maria 1, Santa Clara County 17, Gilroy 13, Los Gatos 1, Mountain View 5, Palo Alto 2, San Jose 13, Santa Clara 2, Sunnyvale 23, Tulare County 1, Ventura County 7, Fillmore 5, Yolo County 49, Winters 2, Woodland 10, Tulare 1.

Mumps

430 cases: Albany 3, Berkeley 5, Hayward 1, Oakland 26, Piedmont 6, Colusa County 1, Colusa 4, Contra Costa County 1, Pinole 5, Pittsburg 2, Richmond 1, El Dorado County 3, Fresno County 7, Fresno 12, Calexico 1, Kern County 4, Taft 1, Lassen County 4, Los Angeles County 14, Alhambra 1, Azusa 1, Claremont 1, Compton 1, Glendale 1, Glendora 1, Long Beach 30, Los Angeles 28, Pasadena 8, Pomona 6, Santa Monica 2, Sierra Madre 1, Torrance 3, Monterey Park 1, Mariposa County 1, Merced County 1, Merced 3, Monterey County 1, Salinas 3, Orange County 9, Orange 1, Santa Ana 11, Placer County 1, Colfax 4, Riverside County 9, Beaumont 6, Corona 72, Riverside 16, Sacramento 43, San Bernardino County 1, San Bernardino 1, San Diego County 8, San Diego 1, San Joaquin County 8, Stockton 7, San Luis Obispo 1, Lompoc 1, Santa Barbara 7, San Jose 3, Sierra County 3, Stanislaus County 1, Modesto 1, Patterson 7, Tehama County 1, Red Bluff 3, Tulare 1, Ventura 1, Yolo County 6, Davis 1.

Pneumonia (Lobar)

129 cases: Oakland 8, Contra Costa County 1, Richmond 1, Fresno 2, Westmoreland 1, Los Angeles County 9, Arcadia 1, Azusa 2, Glendale 2, Huntington Park 1, Long Beach 5, Los Angeles 47, Monrovia 1, Pomona 1, Santa Monica 3, Whittier 2, Lynwood 3, Fort Bragg 1, Merced 3, Salinas 2, Colfax 2, Roseville 1, Sacramento County 1, Sacramento 1, San Bernardino 1, San Diego 1, San Francisco 4, San Joaquin County 2, Stockton 8, Santa Barbara County 3, Santa Barbara 1, Santa Maria 1, Los Gatos 1, San Jose 1, Santa Clara 1, Santa Cruz County 1, Tuolumne County 1, Ventura County 1, Yolo County 1.

Scarlet Fever

331 cases: Alameda County 1, Alameda 2, Berkeley 4, Oakland 4, Butte County 4, Chico 2, Colusa 1, Contra Costa County 3, Richmond 1, El Dorado County 1, Placerville 1, Fresno County 12, Fresno 2, Glenn County 5, El Centro 2, Kern County 3, Taft 1, Los Angeles County 14, Alhambra 5, Burbank 2, Claremont 2, Culver City 9, El Monte 1, Glendale 4, Hermosa 1, Huntington Park 1, Long Beach 3, Los Angeles 48, Montebello 1, Pomona 1, San Fernando 1, Santa Monica 3, Whittier 6, Lynwood 1, South Gate 2, Monterey Park 2, Maywood 1, Madera 1, Ukiah 1, Merced County 4, Monterey County 1, Nevada County 4, Nevada City 3, Fullerton 1, Tustin 1, Riverside County 5, Hemet 3, Sacramento 26, San Bernardino County 3, Redlands 3, San Bernardino 1, San Diego County 6, San Diego 10, San Francisco 41, San Joaquin County 1, Stockton 2, Paso Robles 1, San Mateo County 1, San Mateo 1, San Carlos 2, Santa Barbara 1, San Jose 4, Santa Cruz 1, Sierra County 3, Siskiyou County 3, Etna 2, Stanislaus County 3, Ceres 3, Modesto 2, Sutter County 10, Tehama County 1, Red Bluff 3, Tuolumne County 3, Ventura County 1, Santa Paula 1, Ventura 5, Yolo County 3, Davis 3.

Smallpox

5 cases: Monterey County 3, San Francisco 1, Marysville 1.

Typhoid Fever

9 cases: Berkeley 1, Oakland 1, Kern County 1, Monterey County 1, Fullerton 1, Santa Clara County 2, Stanislaus County 1, Porterville 1.

Whooping Cough

191 cases: Alameda 8, Berkeley 10, Emeryville 2, Oakland 27, Fresno 2, Los Angeles County 8, Beverly Hills 6, Compton 4, Huntington Park 2, Long Beach 6, La Verne 2, Los Angeles 19, South Pasadena 1, South Gate 3, Monterey County 1, Pacific Grove 1, Calistoga 1, Napa 2, Grass Valley 1, Orange County 5, Fullerton 3, Riverside County 2, Riverside 1, Sacramento 21, Colton 1, San Bernardino 1, San Diego County 2, San Diego 11, San Francisco 10, San Joaquin County 2, Lodi 3, Stockton 10, Tracy 4, Paso Robles 1, Santa Clara 1, Santa Cruz 6, Monterey 1.

Meningitis (Epidemic)

4 cases: Los Angeles 1, Mariposa County 1, Sacramento 1, San Bernardino County 1.

Dysentery (Amoebic)

One case: Los Angeles.

Dysentery (Bacillary)

One case: San Diego.

Ophthalmia Neonatorum

One case: Pacific Grove.

Pellagra

2 cases: Los Angeles 1, San Francisco 1.

Poliomyelitis

6 cases: Los Angeles 4, San Francisco 1, Stanislaus County 1.

Tetanus

One case: Compton.

Trachoma

2 cases: Santa Ana 1, Santa Barbara County 1.

Encephalitis (Epidemic)

One case: San Francisco.

Trichinosis

4 cases: San Diego 2, San Francisco 2.

Jaundice (Epidemic)

2 cases: San Francisco.

Food Poisoning

3 cases: Oakland 2, San Francisco 1.

Undulant Fever

5 cases: Los Angeles County 2, Los Angeles 2, San Diego 1.

Septic Sore Throat (Epidemic)

3 cases: Kern County 1, Riverside County 1, South San Francisco 1.

Rabies (Animal)

24 acses: Glendale 1, Los Angeles 18, Torrance 1, Lynwood 1, San Diego 1, San Joaquin County 2.

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* Cases charged to "California" represent patients ill before entering the state or those who contracted their illness traveling about the state throughout the incubation period of the disease. These cases are not chargeable to any one locality.

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